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TITLE: The Association between Suicide and OIF/OEF Deployment History

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## **INTRODUCTION**

One of the most important questions in military suicide research at this time is whether deployment in support of Operations Iraqi or Enduring Freedom (OIF/OEF) is associated with an increased risk of suicide. The equivocal research conducted to date on this topic creates a confusing picture for military senior leaders and the American public. The Report of the Blue Ribbon Workgroup on Suicide Prevention in the Veteran Population (Peake, 2008) reviewed this body of literature and concluded that significant limitations and biases in many of the epidemiological approaches conducted to date contribute to the current confusion. The funded study is specifically designed to address many of the recommendations of that report in order to generate seminal results that will fill what is arguably the most important gap in the epidemiological study of military suicide. This collaborative Department of Defense (DoD) – Veterans Affairs (VA) study will utilize multiple enterprise level databases to determine whether a history of deployment in support of OIF/OEF is a risk factor for suicide. In addition, the proposed study will examine the suicide rates of post-deployed National Guard members and Reservists to determine whether these cohorts are at increased risk of suicide. Furthermore, it will examine rates of deaths of undetermined intent in military and civilian populations to determine whether potential misclassifications of deaths may confound military and civilian comparisons of suicide rates. In examining these suicide rates, the funded study will also specifically account for the potential confounding effect of Service Members who have not completed a full term of service (e.g., because of misconduct, substance abuse, etc.) and thus may be more likely to have risk factors for suicide.

## **BODY**

### ***Accomplishments Years 1 - 3***

The Madigan Army Medical Center (MAMC) Institutional Review Board (IRB) granted continuing review of the research protocol on December 16, 2010. The Human Research Protection Office (HRPO) IRB subsequently granted continuing review on January 10, 2011 and the Department of Veterans Affairs (VA) IRB granted continuing review on February 18, 2011. All other regulatory documentation was previously approved in accordance with the granting agency. Staffing for the grant was completed, including the hiring of a Biostatistician

Over the course of the second year, the T2 study team agreed upon and signed a Memorandum of Understanding (MOU) with the Defense Manpower Data Center (DMDC) and Centers for Disease Control's (CDC) National Death Index (NDI) Program. The MOU went into effect March 1, 2011. Additionally, the DMDC data was incorporated into the CDC's NDI application to format and submit data on T2's behalf.

The DMDC designated a DMDC file manager to the T2 data request to assist in compiling the data to be sent to the NDI. The initial DMDC data pull was comprised of only PII of all Service Members who have served in the military during calendar years (CY) 2001-2007. Consequently, the DMDC sent two datasets to the NDI for matching. The first dataset included

all Service Members who had been confirmed deceased as verified by the DMDC's Casualty file and Defense Casualty Information Processing System's (DCIP) file, as well as the Social Security Administration's (SSA) – Death Master File (DMF). The "Known Decedent" dataset contained approximately 42,000 individual records. The second dataset included all service members presumed alive, through January 2011, containing roughly 4.2 million records. The NDI matching procedures were delayed until 2009 decedent records became available from the CDC in August 2011. The funding agency completed payment to the CDC's NDI program for their services in the amount of \$1,156,046.00.

Following the NDI's release of the 2009 decedent data, the NDI team completed the matching of DMDC records against NDI records. T2 performed quality control (QC) assessments of decedent data using the SSA-DMF and a manual review process. T2 documented all methodological procedures and workflow to ensure consistent and accurate data quality and record keeping. T2 thoroughly researched the existing literature on manual review procedures and consulted with a subject matter expert to inform development of a customized process to assess records that required manual review. A Statistical Analysis Software (SAS) application, which works in conjunction with Microsoft (MS) Access, was obtained and evaluated through consultation with a subject matter expert. On recommendation of the subject matter expert, the study team customized the SAS code to conform to the characteristics of the study data; the results were reviewed and validated. The STATA program needed to conduct epidemiological data analyses was purchased and installed.

T2 has merged all data sources and conducted quality control procedures. T2 has met regularly with their VA collaborators and other researchers and subject matter experts familiar with DMDC and NDI data to ensure all key variables were correctly identified, and to discuss potential complications of, and solutions to, combining multiple enterprise level data sources. Initial analyses for suicide rates were conducted and results were presented at the VA/DoD Suicide Conference in Washington, DC in June/2012.

### *Recent Achievements*

T2 submitted a manuscript entitled, "Mortality Ascertainment in a Military Cohort: Does Active Duty Status Affect Validity?" to the *American Journal of Epidemiology* (AJE) in February/2013. This research assessed for the presence and magnitude of information bias related to the mortality data received for our cohort from the NDI. Results indicated that the potential for differential bias with NDI records for discharged Service Members was negligible; the manuscript provides an exposition of the rigorous methods implemented to validate our data sources. The manuscript was not accepted for publication in the AJE; T2 is preparing the manuscript for resubmission.

T2 presented the results of the principal study hypotheses at the most recent In-Progress Review (IPR) meeting, May 2013. One positive outcome of the IPR was the opportunity to share information with the Army STARRS group. They had some similar data that was in contrast to our results. In speaking with Dr. Ursano about similarities and differences in our methodologies, the PI left that meeting and did additional research on the difference between two mortality

datasets (DCIPS and AFMES data). In theory, they should be the same, but the PI found some data suggesting there are minor differences. In an abundance of caution, the PI is obtaining the gold standard data from AFMES and has that agreement in place. The AFMES data will permit the study team to further validate the conclusions presented.

T2 has completed a manuscript containing the results of the principal study hypotheses; this manuscript will be submitted for publication after the AFMES data are received, incorporated, and the data are re-analyzed. Results of our initial data analyses do not support an association between deployment and suicide mortality, consistent with our hypothesis; early military separation appears to be associated with increased suicide rates, particularly among decedents who separated within 6 months of military accession. We do not predict that the results of the re-analysis with AFMES data will alter these findings.

In addition, one of the goals of the grant is to transition this project to a DoD resource that can be updated in the future. The PI was the DoD Lead for the VA/DoD Suicide Nomenclature and Data Working Group. This Workgroup reports directly to the Joint Executive Council (JEC; Co-Chaired by USDP&R). The JEC asked the Workgroup to develop an implementation plan and cost estimate for a joint DoD-VA suicide repository that could solve some of the problems that this grant was developed to address. The PI had the opportunity to present this grant methodology to the Workgroup, who responded favorably. The PI led the development of a draft plan for the workgroup based on lessons learned through this grant. The lead for the DoD-VA Suicide Data Repository has now transitioned to the Defense Suicide Prevention Office (DSPO) and Dr. Woodson publically announced the plans for the Repository last year. The PI continues to consult with the DSPO on this solution. The efforts of this grant have been leveraged significantly to help move that effort forward. This represents significant progress toward the goal of transitioning the benefits of this research to a more permanent DoD solution.

Finally, it is particularly noteworthy that the Director of Mrs. Obama's Joining Forces initiative wrote a policy brief in which she praised this project as an example of what the DoD should be doing. This brief can be found in, "Losing the Battle: The Challenge of Military Suicide" by Margaret Harrell and Nancy Berglass, published October 2011 by the Center for a New American Security. Ms. Harrell also testified before the House Committee on Veterans' Affairs on the findings of this Policy Brief on 12/2/2011.

### *Modifications*

The research protocol was modified to include IT personnel of Robert Kayl and Scott Swim on 17 October 2012. Continuing review was submitted and approved on 08 January 2013 – 07 January 2014; this was submitted to HRPO and acknowledgement was received on 04 February 2013. The research protocol was modified to obtain death data from the AFMES; this was submitted on 01 July 2013, and anticipated approval of the amendment is 05 August 2013. We requested these additional death records based on feedback received at the IPR meeting in May 2013; the AFMES death data contain ICD codes, which will strengthen the validity of our findings.

A No Cost Extension is being requested in order to allow for review and analysis of additional data from AFMES.

### *Challenges*

Even though a longer than anticipated time period to receive data from both the DMDC and CDC's NDI program was encountered, data cleaning, validation and analysis of the original data has been completed.

The Research team continues working to maximize data quality control procedures. T2 will continue work to ensure that the de-identified data has not been transformed or encountered other linkage problems along the way.

We anticipate the need for data cleaning, validation and re-analysis after we have incorporated the data containing additional death data from AFMES.

## **KEY RESEARCH ACCOMPLISHMENTS**

### *Administrative and Logistical Matters*

1. Personnel
  - a. Addition of local IT personnel occurred (Scott Swim and Robert Kayl)
2. Equipment
  - a. Computer purchased to complete data analysis.
  - b. External hard drive purchased.
  - c. MPlus Version 7 Software purchased for data analysis
  - d. PASS 12 Software purchased for data analysis.
3. Materials, supplies and consumables
  - a. Purchased office supplies (paper and CDs for data)
4. Institutional Review Board (IRB)
  - a. MAMC IRB continuing review approved on January 08, 2013.
  - b. HRPO IRB continuing review approved on February 04, 2013.
  - c. VA IRB continuing review approved on December 7, 2012.

## **REPORTABLE OUTCOMES**

We have completed the initial analyses pertaining to the principal study hypotheses. These findings were reported at the IPR meeting in May 2013. We plan to execute final analyses and disseminate findings in a peer reviewed journal as soon as we have incorporated the data from AFMES. We do not expect the pattern of results to change with the addition of the AFMES death data, however, these data will further validate our findings and provide quality control procedures.

## **CONCLUSION**

None

## **REFERENCES**

Peake, J. B. (2008). The Blue Ribbon Work Group of Suicide Prevention in the Veteran Population. Chartered by Secretary of Veterans Affairs James B. Peake, May 5, 2008.

## **APPENDICIES**

None